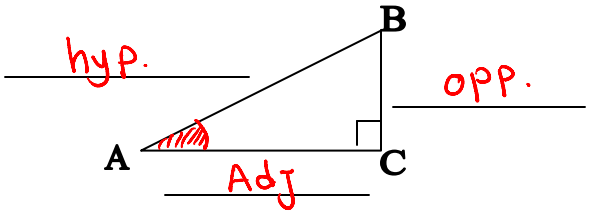
Name: _____ **Date:** _____

Math 10F&PC Chapter 2 Trigonometry

2.6 Applying the Trigonometric Ratios

Solving a triangle means to determine the measures of all the angles and the length of all sides in the triangle.

We can use any of the three primary trigonometric ratios to do this.



sin A= $\frac{opp}{hyp}$; cos A = $\frac{Adj}{hyp}$; tan A = $\frac{opp.}{Adj}$

To recall these trigonometric ratios quickly, remember the acronym:

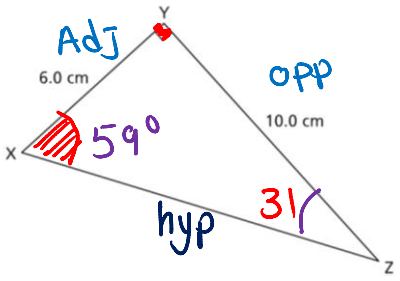
S O H C A H T O A

Example 1: Solve this triangle. Give the measures to the nearest tenth where necessary.

Find the missing Angles :-

calculate $\angle x$ $\tan\angle x = \frac{opp}{Adj} = \frac{10}{6}$

$\angle x = \tan^{-1}\frac{10}{6}$ $\angle x = 59^\circ$ $\therefore \angle Z = 31$



Find the length of xz

$\cos 59 = \frac{6.0}{xz}$ $xz = (6.0)\cos 59^\circ = 11.6$ cm

$xz = \sqrt{6.0^2 + 11.0^2} = \sqrt{136} = 11.6$

Example 2: Solve this triangle. Give the measures to the nearest tenth where necessary.

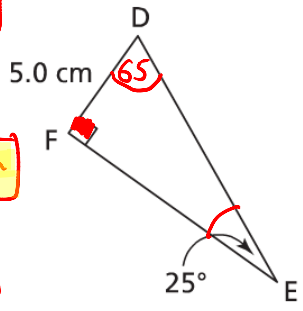
You try $\angle D + \angle E = 90^\circ$ $\therefore \angle D = 90 - 25 = 65^\circ$

Solve for EF :-

$\tan = \frac{opp}{Adj}$ $\tan 25^\circ = \frac{5.0}{EF}$ $EF = \frac{5.0}{\tan 25}$ $EF = 10.7$ cm

Solve for DE :-

$\sin 25^\circ = \frac{5.0}{DE}$ $DE = (5.0)\sin 25^\circ = 11.8$ cm



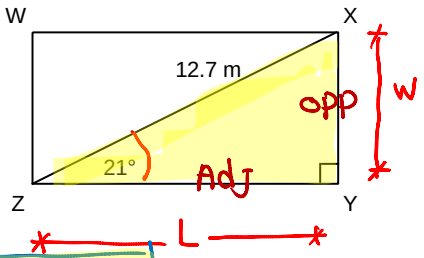
Example 3: Determine the area of this rectangle to the nearest tenth of a square meter.

Area of Rect = L x W

$\frac{\sin 21^\circ}{1} = \frac{W}{12.7}$ $\quad W = (12.7)(\sin 21^\circ)$ $\quad W = 4.55$ m

$\frac{\cos 21^\circ}{1} = \frac{L}{12.7}$ $\quad L = (12.7)(\cos 21^\circ)$ $\quad L = 11.85$ m

$A = (11.85)(4.55) = 53.917 = 53.9\ m^2$



Example 4: A small table has the shape of a regular octagon. The distance from one vertex to the opposite vertex, measured through the centre of the table, is approximately 30 cm. There is a strip of wood veneer around the edge of the table. What is the length of this veneer to the nearest centimetre?

$\angle A = \frac{360^\circ}{8} = 45^\circ$

$\frac{45^\circ}{2} = 22.5^\circ$

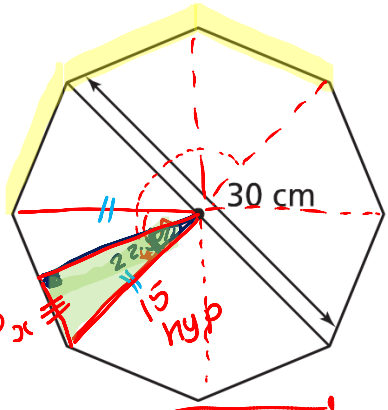
Solve for (x)

$\sin 22.5^\circ = \frac{x}{15}$ $\quad x = (15)(\sin 22.5^\circ)$

$x = 5.74$ cm

each side of the octagon = $2 \times 5.74 = 11.48$ cm

the total length $= 8 \times 11.48 = 91.84$ cm $\simeq$ 92 cm



Example 5: A cone is formed by cutting out the shape below and joining the straight edges with tape. Calculate the angle of inclination of the side of the cone to the nearest tenth of a degree.

1. Find the radius (r) for the base of the Cone

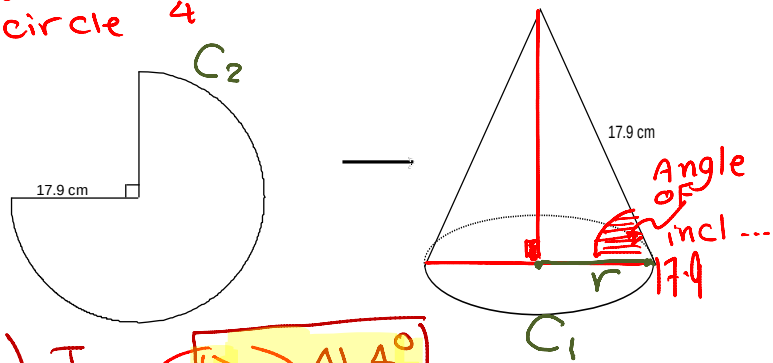
The circumfence C of the base of the Cone = $\frac{3}{4}$ the circumference of the circle

$C_1 = \frac{3}{4} C_2$

$2\pi r = \frac{3}{4}(3.14)(17.9)(2)$

$r = 13.245$ cm

Then we have the hyp = 13.245



$\angle A = \frac{Adj}{} = \angle A =$ Cos Cos Adj $\quad \Rightarrow 41.4^\circ$

Assignment: page 111 Q #4, 5, 7, 9, 10 and 11